Lesson Two

All about Liquids

Big Question(s):

What makes a liquid, a liquid?

Content Statement-

**P.PM.E.2 States of Matter- Matter exists in several different states: solids, liquids, and gases. Each state of matter has unique physical properties. Gases are easily compressed,**

**but liquids and solids do not compress easily. Solids have their own particular shapes, but liquids and gases take the shape of the container.**

**P.PM.E.1 Physical Properties- All objects and substances have physical properties that can be measured.**

**P.CM.E.1 Changes in State- Matter can be changed from one state (liquid, solid, gas) to another and then back again. Heating and cooling may cause changes in state.**

Content Expectation-

**P.PM.04.23** Compare and contrast the states (solids, liquids, gases) of matter.

**P.PM.04.16** measure the weight (spring scale) and mass (balances in grams or kilograms) of objects.

**P.PM.04.17** measure volumes of liquids in milliliters and liters.

**P.CM.04.11** explain how matter can change from one state (liquid, solid, gas) to another by heating and cooling.

**Technology**

Advocate and practice safe, legal, and responsible use of information and technology

Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity

Understand and use technology systems

Select and use applications effectively and productively

Collect and analyze data to identify solutions and/or make informed decisions

Create original works as a means of personal or group expression

Use models and simulations to explore complex systems and issues

Scheduled Time

1 week.

Objectives/Goals- (Students will be able to…)

Science

Liquids

* Identify 8 liquids.
* Give a definition of a liquid.
* Draw and explain molecular make up of liquids.
* Identify ways in which liquids change (solidify/freeze or evaporate).
* Identify properties of liquids.
* Compare and contrast different liquids.
* Compare and contrast solids and liquids.
* Measure the weight and mass of objects.
* Measure the volume of liquids.
* Explain the similarities and differences among solids, liquids, and gases.
* Explain how matter can change from one state to another by heating and cooling.

**Engage**

Science GLECs covered

**P.PM.04.23** Compare and contrast the states (solids, liquids, gases) of matter.

Teacher has a clear, pitcher of water and a bottle of red, liquid, food coloring. Teacher poses the question, “What will happen if I add the red food coloring to the clear water? What if I leave the pitcher on my desk, what do you think will happen then? What if I put some of the water in a cool place?” Students record their thoughts on a post-it note and place the note on the board. Giving the students 3-5 minutes to write down their thoughts, the teacher then removes some of the notes from the board and shares them aloud with the students. If students need more space to write, they can write in their science journal and share from their journal. Teacher explains that the students will be investigating liquids today and writes the Big Question on the board… “what makes a liquid, a liquid?”

**Explore**

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Use models and simulations to explore complex systems and issues

Students work in small groups and are given several different liquids to investigate (water, juice, pop, rubbing alcohol, paint, oil, and vinegar). Students are investigating properties of different liquids, comparing liquids, asking questions about liquids and possible reactions. Students will also be using measurement tools (graduated cylinders and measuring cups) to measure liquids. Students should also be observing that some of the given liquids change state (evaporate or solidify). Some groups may wish to set up other investigations relating to liquids. Students are encouraged to document their ideas, thoughts, observations, questions, hypotheses, etc. in their science journal for future referencing and/or review. Allow students 30-60 minutes to investigate and observe the given liquids. Stop and clean up, before bringing the students back together for discussion. After the students are able to investigate liquid on their own the teacher will set up an evaporation experiment. Each group will be given different types of liquids and be provided the same types of cylinders at various sizes. The students will set up the cylinders and measure the liquids every day. The students will use excel to help record their findings at the end of every day. When the experiment is done at the end of the week the students will take the data and put it in charts and graphs from using excel. Excel helps to provide a program for students that will help them stay organized and be able to present their findings to the class in an organized, clear way. Teacher will be with the students in the computer lab to help with any problems that occur while doing this.

**Explain**

Science GLECs covered

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**Technology**

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After clean up, bring students back together and the teacher reads aloud, The Properties of Liquids. Students develop (with the guidance of teacher) a formal definition of a liquid. Teacher also discusses the molecular make up of liquid. The teacher will use United Streaming video to help reinforce the properties of liquids and the molecular make up of different liquids.

Students will then share observations, investigations, questions, answers, etc. Students should present their findings using power point. Students will use power point to present their findings to the class. They will also create charts, graphs( from excel), and illustrations( images found from the web) to communicate what they observed and/or write procedures, as well as, reviewing questions they may have about the investigated state or the investigation itself. By using power point students will be able to organize their thoughts and findings into a clear precise report. Using excel helps to keep track of the data found and easily made into readable charts and graphs. By finding illustrations or pictures from the web students will be able to find correct models to represent their findings which might be hard to represent by drawing by hand. Students may also want to choose to do a concept map to show key ideas, vocabulary, and content; making connections with science content, multiple informational sources, and personal experiences. There are a couple of different computers programs that can help with this. These programs will help the students to stay organized and keep their thoughts clear and legible. Teacher will be with students in the computer lab to help with any problems that occur. If many problems occur that many students have the teacher may use the master computer and show all the students how to do it.

**Extend**

Science GLECs covered

**P.PM.04.23** Compare and contrast the states (solids, liquids, gases) of matter.

**P.CM.04.11** explain how matter can change from one state (liquid, solid, gas) to another by heating and cooling.

Students Think, Pair, Share comparing and contrasting the given liquids. Students should also be encouraged to relate their experiences from the Engage activity to their experiences with other liquids.

Students also Think, Pair, Share comparing what they have learned from the previous lesson about solids and today’s lesson about liquids. How are they alike? How are they different?

Bring class back together and allow for whole class discussion. Record student comments, thoughts, and ideas.

**Evaluate**

Science GLECs covered

**P.PM.04.23** Compare and contrast the states (solids, liquids, gases) of matter.

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Formative Assessment Examples-

1. Observations during Explore activity.

Observe students during investigations, ask questions to probe student understanding of states of matter while observing cooperative groups.

1. Class discussion and/or small group discussions.

Students will be speaking in clear and effective voices to communicate thoughts, ideas, prior knowledge/experiences, and/or summarizing science content.

1. Student journals.

Teacher checks the results of the weight, mass, and volume measurements. Use student investigations and science journals to assess ability to describe properties of matter and changes of state. Use student investigations to assess their ability to ask questions based on observations of properties of matter.

1. Science Startup, Item 2/ES/changes in matter and Item 6/ES/changes in matter.

Students will be responding and summarizing ideas learned from lesson and multiple texts used to deliver science content. They should be writing neatly and legibly in their own voice and style, with correctly structured sentences and the use of proper grammar. Students will be proof reading their writing assignment, using peers for editing and/or other resources prior to teacher evaluation.

Summative Assessment Examples-

1. Adding more information to properties of liquids on the Bag-n-Tag board.

Students will begin developing ideas for a display board, called the “Bag-n-Tag” board. They will be collecting, illustrating, labeling, and displaying examples of each state of matter, from their home. After completing each lesson, students will be able to continue to add to their own board with greater knowledge, vocabulary, descriptor words, and connection from content to self/home.

1. Windowpane review about liquids.

Students will be illustrating, retelling, and asking questions based on multiple textual experiences. They should be writing neatly and legibly, beginning to generate descriptive words for each state, and correctly spelling encountered words.

1. Quiz on liquid information and activity.

Students are given written assessment over liquid content covered (vocabulary, compare/contrasting, application, measuring, etc.)